

MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH  
(SEE MAP FOR APPROPRIATE REGIONAL OFFICE)

**FORM R - PERMIT APPLICATION FOR LAND APPLICATION  
OF INDUSTRIAL WASTEWATER BIOSOLIDS AND RESIDUALS**

**FOR AGENCY USE ONLY**

PERMIT NUMBER

MO-

DATE RECEIVED

**INSTRUCTIONS:** FORMS A & C or F (CAFOs) (and D where applicable) must also be submitted for land application of industrial wastewater sludge biosolids or residuals. Submit FORMS E and G for land disturbance permit if construction areas total five acres or more.

Attach FORM I, If wastewater will be land applied or irrigated.

**1.00 FACILITY INFORMATION**

1.10 Facility Name

1.20 Application for: ☐ Construction Permit (attach Engineering report, Plans and Specifications per 10 CSR 20-8.020)  
☐ Operating Permit (if no construction permit, attach engineering documents)  
Date Land Application System Began Operation: \_\_\_\_\_  
☐ Operating Permit Renewal

1.30 Months when the business or enterprise will operate or generate sludge or residuals:  
☐ 12 months per year ☐ Part of year (list Months): \_\_\_\_\_

1.40 List the Facility outfalls which will be applicable to the land application system from outfalls listed on Form A, C, D and F.  
Outfall Nos. \_\_\_\_\_

**2.00 STORAGE BASINS**

2.10 Number of storage basins: \_\_\_\_\_ Type of basin: ☐ Steel ☐ Concrete ☐ Fiberglass ☐ Earthen ☐ Earthen with membrane liner

2.20 Storage basin dimensions at inside top of berm (feet): Report freeboard as feet from top of berm to emergency spillway or overflow pipe.  
(Complete Attachment A: Profile Sketch)  
Basin #1: Length \_\_\_\_\_ Width \_\_\_\_\_ Depth \_\_\_\_\_ Freeboard \_\_\_\_\_ Berm Width \_\_\_\_\_ % Slope \_\_\_\_\_  
Basin #2: Length \_\_\_\_\_ Width \_\_\_\_\_ Depth \_\_\_\_\_ Freeboard \_\_\_\_\_ Berm Width \_\_\_\_\_ % Slope \_\_\_\_\_

2.21 Storage basin volumes (gallons): Permanent volume means two foot water depth for seal protection, and any required treatment volume capacity.  
Basin #1: Gallons: \_\_\_\_\_ Permanent Volume + \_\_\_\_\_ Storage = \_\_\_\_\_ Total volume (gallons)  
Basin #2: Gallons: \_\_\_\_\_ Permanent Volume + \_\_\_\_\_ Storage = \_\_\_\_\_ Total volume (gallons)

2.30 Storage Basin operating levels (report as feet below emergency overflow level)  
Basin #1: Maximum water level \_\_\_\_\_ ft. Minimum operating water level \_\_\_\_\_ ft.  
Basin #2: Maximum water level \_\_\_\_\_ ft. Minimum operating water level \_\_\_\_\_ ft.

2.40 Storage Basin design storage capacity: (storage between minimum and maximum operating levels for 1-in-10 year storm water flows.)  
Basin #1: \_\_\_\_\_ days Basin #2: \_\_\_\_\_ days Basin #3: \_\_\_\_\_ days

2.50 Attach Water Balance Test results to verify earthen basin seal in accordance with 10 CSR 20-8.020(13) and (16), when required by the department.

2.60 Attach a sludge management plan for materials that are not land applied.

2.70 Attach a closure plan for lagoons, storage basins and treatment units.

**3.00 LAND APPLICATION SYSTEM**

3.10 Number of application sites \_\_\_\_\_ Total Available Acres \_\_\_\_\_ Minimum & Maximum % field slopes \_\_\_\_\_  
Location: \_\_\_\_\_ 1/4 \_\_\_\_\_ 1/4 \_\_\_\_\_ 1/4 \_\_\_\_\_ Sec. \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ County \_\_\_\_\_ Acres  
Location: \_\_\_\_\_ 1/4 \_\_\_\_\_ 1/4 \_\_\_\_\_ 1/4 \_\_\_\_\_ Sec. \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ County \_\_\_\_\_ Acres  
Attach extra sheets as necessary.

3.12 Type of vegetation: ☐ Grass hay ☐ Pasture ☐ Timber ☐ Row crops ☐ Other (describe) \_\_\_\_\_  
Specific Crops and Yields/acre: Goal: \_\_\_\_\_ Actual for last five years: \_\_\_\_\_

3.20	Annual sludge production (gallons per year): _____ Actual _____ Design _____ (dry tons per year): _____ Actual _____ Design _____ Human Population Equivalent: _____ Actual _____ Design _____
3.21	Land Application rate per acre: Design: _____ dry ton/year      _____ dry ton/application      _____ No. applications/year Actual: _____ dry ton/year      _____ dry ton/application      _____ No. applications/year Total amount land applied each year (total all sites) Design _____ dry ton/year      Actual _____ dry ton/year Actual months used for land application (circle):    Jan   Feb   Mar   Apr   May   Jun   Jul   Aug   Sep   Oct   Nov   Dec
3.22	Land Application Rate is based on: <input type="checkbox"/> Nutrient Management Plan (N&P) <input type="checkbox"/> PAN <input type="checkbox"/> Conservative <input type="checkbox"/> Hydraulic Loading <input type="checkbox"/> Limiting Pollutant (Specify) _____ <input type="checkbox"/> Other (describe) _____
3.30	Equipment type: <input type="checkbox"/> Tank wagon <input type="checkbox"/> Tank truck <input type="checkbox"/> Subsurface injection <input type="checkbox"/> Slinger spreader <input type="checkbox"/> Dry spreader <input type="checkbox"/> Other (describe) _____ Equipment Capacity: _____ Gallons (cubic feet) per hour      _____ Total hours of operation per year
3.40	Public Use/Access Sites: If public use or access to land application site, describe pathogen treatment and site access restrictions. If human, animal, or organic wastes, refer to 40 CFR 503.32 for pathogen treatment methods. Attach extra sheets as necessary. _____
3.50	Separation distance (in feet) from the outside edge of the biosolids application area to down gradient features: _____ Permanent flowing stream    _____ Losing Stream    _____ Intermittent (wet weather) stream    _____ Lake or pond _____ Property boundary    _____ Dwellings    _____ Water supply well    _____ Other (describe) _____
3.60	SOILS INFORMATION:    Use information from the County Soil Survey, NRCS, or professional soil scientist. NOTE: On-site soils classification by a professional soil scientist may be required by the department where appropriate. Soil Series Name _____      Depth to bedrock _____ Feet      Depth to water table _____ Feet Soil Infiltration rate in inches/hour (in/hr) for most restrictive layer within the following soil depth ranges: _____ In/hr for 0-12 inch soil depth      _____ In/hr for 12-24 inch soil depth      _____ In/hr for 24-60 inch soil depth
3.70	Attach Nutrient Management Plan (NMP) including calculations for plant available nitrogen (PAN) and other nutrients, crop requirements, crop yields and other management factors. Include USDA/NRCS phosphorus recommendations.
3.80	Geologic Investigation:    _____ Date of most recent Geologic Report by Department's Division of Geology and Land Survey.
3.81	Ground Water Monitoring Wells: (Attach Groundwater Monitoring Plan when required by department) <input type="checkbox"/> NONE <input type="checkbox"/> EXISTING <input type="checkbox"/> PLANNED      NUMBER: _____ Monitoring Wells    _____ Lysimeters
3.90	Attach a current copy of the Operation and Maintenance (O&M) Plan for the land application system.    Date of O&M Plan: _____
3.91	Attach a site map showing topography, storage basins, land application sites, property boundary, streams, wells, roads, dwellings and other pertinent features.
3.92	Attach a facility sketch showing treatment units, storage basins, pipelines, application sites and other features.
<b>4.00 INDUSTRIAL PROCESS INFORMATION</b>	
4.10	Brief description of treatment processes prior to land application and note any changes made in last five years. (Attach extra sheets as necessary.) _____ _____
4.11	Detailed description of industrial production processes. Also indicate any changes made in last five years.(attach extra sheets as necessary) _____ _____

4.20 List of raw materials, chemicals, additives, products, and by-products (Attach extra sheets as necessary)

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4.31 Attach following FORMS for wastewater to be land applied.  
 FORM C or F is required for all applicants. Use Form F for CAFOs.  
 FORM D is required for those industries listed in the Form D instructions or when required by the department.  
 Use actual testing results within last 12 months. For new operations use testing results from other similar operations or from published literature.

4.32 Are there any listed hazardous wastes in the material to be land applied: ☐ YES ☐ NO (If YES, attach testing results)

4.40

A. Are any Pollutants listed in 40 CFR 268.40 believed to be present in detectable concentrations: ☐ YES ☐ NO

B. Are any Pollutants listed in 10 CSR 20-7.031 believed to be present in detectable concentrations: ☐ YES ☐ NO

C. Are any Pollutants listed in EPA Process Design Manual for Land Treatment of Municipal Wastewater publication EPA-625/1-81-013, Table 4-5 and Table 4-16 believed present in detectable concentrations: ☐ YES ☐ NO

(Attach a copy of testing results for any pollutants that may be present in detectable concentrations.)

4.50 Environmental Assessment. Do any of the pollutants detected exceed the criteria for pollutant concentrations of limitations contained in the publications referenced in Section 4.40 of this form: ☐ YES ☐ NO

If YES, attach a copy of the Environmental Assessment as required in 10 CSR 20-8.020(3)(D).

**5.00 SOIL TESTING RESULTS:** Complete information for each pollutant listed and each land application site. Attach results of any other soil testing performed in the last 12 months. Soil sampling and testing should conform to University publication G9110, Sampling Your Soil for Testing; Soil Test Procedures for North Central Region (North Dakota Agricultural Experiment Bulleting 499-Revised); Methods of Soil Analysis, American Society of Agronomy, Inc; Soil Testing and Plant Analysis, Soil Science Society of America, Inc; EPA Methods; or other methods approved by the department. Attach extra sheets as necessary.

Total area sampled is \_\_\_\_\_ acres. Each composite sample covers \_\_\_\_\_ acres. Each composite consists of \_\_\_\_\_ subsamples.  
 Sample depth: ☐ 0-6 inches ☐ 0-12 inches ☐ Other (describe) \_\_\_\_\_

Pollutant	Concentration (mg/kg or ppm)			Pounds/ Acre	No. Composite Samples	Sample Period
	Minimum	Maximum	Average			
Organic Nitrogen as N						
Ammonia Nitrogen as N						
Nitrate Nitrogen as N						
Phosphorus as P (Bray 1P)						
Exchangeable Sodium %						
Organic Matter (percent )						
Cation Exchange Capacity						
pH (standard units)						

Other pollutants present in the material to be land applied: (Attach extra sheets as necessary)


**6.00 LAND LIMITING CONSTITUENTS FOR LAND APPLICATION**

6.10 Metals of Concern for Land Application. Complete information for each pollutant listed. Analysis results must be for "TOTAL METALS". (Do NOT use TCLP, dissolved, total recoverable or other extraction methods. Include all test results for the last 5 years and a minimum of 4 separate samples.

Pollutant (total metals)	Concentration (mg/kg dry weight)			Design LBS/ Acre/Year	Type of Samples	Number Samples	Sample Location	Sample Period
	Minimum	Maximum	Average					
Aluminum								
Arsenic								
Beryllium								
Cadmium								
Chromium								
Copper								
Fluoride								
Lead								
Manganese								
Mercury								
Molybdenum								
Nickel								
Selenium								
Silver								
Tin								
Zinc								

6.20 Major Pollutants of Concern for Land Application. Complete information for each pollutant listed. Include any other pollutants that are most limiting for determining land application rates. Attach extra sheets as necessary.

Pollutant	Concentration (mg/kg dry weight)			Design LBS/ Acre/Year	Type of Samples	Number Samples	Sample Location	Sample Period
	Minimum	Maximum	Average					
Organic Nitrogen as N								
Ammonia Nitrogen as N								
Nitrate Nitrogen as N								
Total Nitrogen as N								
Plant Available Nitrogen (PAN)								
Total Phosphorus as P								
Boron								
Chlorides								
Sodium								
COD								
TPH								
Total Suspended Solids								
Oil & Grease								
Sodium Adsorption Ratio (SAR)								
pH (standard units)								

6.30 Other Limiting Pollutants for Land Application Rates. Specify any other pollutants that are most limiting for determining land application rates. Include any additional significant pollutants from Section 4 that is not already listed in Section 6.00. Attach extra sheets as necessary.

Pollutant	Concentration (mg/kg dry weight)			Design LBS/ Acre/Year	Type of Samples	Number Samples	Sample Location	Sample Period
	Minimum	Maximum	Average					

6.40 Requirements for Public Use Sites. Complete this if land application onto public use or public access sites or if material will be distributed for general public use. Fecal Coliform, Salmonella and Enteric Virus must be tested if the biosolids include waste material from humans, animals, vegetables or organic matter.

Pollutant		Concentration (dry weight)			Type of Samples	Number Samples	Sample Location	Sample Period
		Minimum	Maximum	Average				
Total Dioxin TEQ*								
*Required Only for public access sites. TEQ = Toxicity Equivalents for CDD and CDF isomers per EPA Publication EPA/625/3-89/016 and EPA method 1613. Detection limits must be less than 1.0 ppt.								
Fecal Coliform								
Salmonella								
Enteric Virus								
Other (specify)								

## 7.00 CERTIFICATION

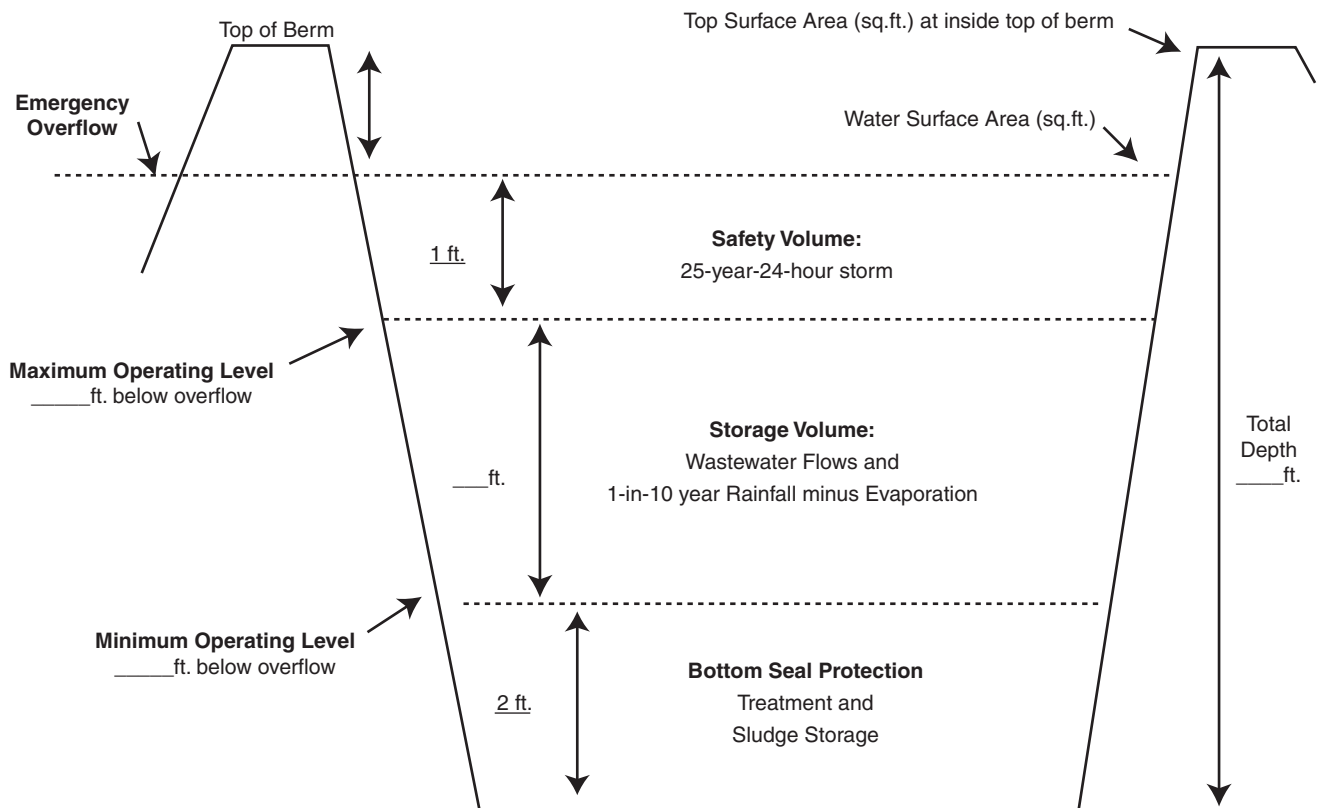
I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED IN THIS APPLICATION AND ALL ATTACHMENTS AND THAT BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THIS INFORMATION, I BELIEVE THAT THE INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE OR IMPRISONMENT.

CONSULTING ENGINEER - Name, Official Title and Engineering Firm (TYPE OR PRINT)		TELEPHONE NUMBER (area code and number)
SIGNATURE		DATE SIGNED
OWNER OR AUTHORIZED REPRESENTATIVE - Name and Official Title (TYPE OR PRINT)		TELEPHONE NUMBER (area code and number)
SIGNATURE		DATE SIGNED

## ATTACHMENT A

(To be included with Form I and Form R)

### Lagoon or Storage Basin PROFILE SKETCH



#### DEFINITION OF TERMS (REFER TO THE PROFILE SKETCH ABOVE).

- Freeboard is depth from top of berm to emergency spillway (minimum 1 foot);
- Safety Volume is depth for 25-year, 24-hour storm (minimum of 1 foot);
- Maximum Operating Level is at bottom of the safety volume (minimum of 2 feet below top of berm).
- Minimum Operating Level is 2 feet above bottom of lagoon for seal protection per 10 CSR 20-8.020(15)(D).  
The minimum operating level may be greater than 2 feet when additional treatment volume is included.
- Storage Volume and days storage are based on the volume between Minimum and Maximum Operating Levels.
- Total Depth is from top of berm to bottom of basin including freeboard.